BRITISH COLUMBIA MINERAL EXPLORATION REVIEW 1983

INFORMATION CIRCULAR

BRITISH COLUMBIA
EXPLORATION REVIEW 1983

by

Staff, Geological Survey
British Columbia Ministry of Energy, Mines and Petroleum Resources

Information Circular 1984-1
Victoria
British Columbia
January 1984

INTRODUCTION

British Columbia's exploration indicators showed a dramatic improvement in 1983. Total claims staked in 1983 was an all-time record at 108 000 units, an impressive 152 per cent increase over 1982 (Fig. 1). The previous record was 91 000 claims recorded in 1966. The number of placer lease applications in 1983 was 1 367, a 24 per cent increase over the 1982 total of 1 441. However, the 109 coal licence applications received was a reduction of 51 per cent from 1982, as the worldwide demand for coal weakened further.

Figure 1. Mineral claims recorded in British Columbia, 1982 and 1983.

Figure 2. Mineral exploration expenditures and number of mineral claims recorded, 1971-1983.

Mineral exploration expenditures are estimated at $57 million, a slight decrease from last year's level of $64 million, but a significant reduction from the 1981 level of $112 million (Fig. 2). Expenditures in coal exploration are estimated at $9 million, a reduction of 50 per cent from 1982. However, the number of companies active in British Columbia in 1983 is estimated at 800, an approximately 100 per cent from 1982.

TABLE 1. MINERAL CLAIMS RECORDED 1983

Mining Division	No. of Claims	Claims per 1 000 km^2
Atlin	1 [illegible]	[illegible]
Cariboo	1 [illegible]	[illegible]
Clinton	1 [illegible]	[illegible]
Cranbrook	4 [illegible]	[illegible]
Dawson Creek	2 [illegible]	[illegible]
Golden	1 [illegible]	[illegible]
Greenwood	4 [illegible]	[illegible]
Kamloops	9 [illegible]	[illegible]
Liard	2 [illegible]	[illegible]
Lillooet	4 [illegible]	[illegible]
Nanaimo	1 [illegible]	[illegible]
Nelson	1 [illegible]	[illegible]
New Westminster	1 [illegible]	[illegible]
Nicola	[illegible]	[illegible]
Omineca	13 [illegible]	[illegible]
Osoyoos	2 442	235
Revelstoke	2 [illegible]	[illegible]
Skeena	7 [illegible]	[illegible]
Slocan	[illegible]	[illegible]
Trail Creek	[illegible]	[illegible]
Vancouver	2 [illegible]	[illegible]
Vernon	[illegible]	[illegible]
Victoria	1 [illegible]	[illegible]
TOTAL	[illegible]	

In the metal sector, the spark for this activity was provided by the search for precious metals and massive sulphide-type base metal deposits. Although many exploration programs were low budget, several significant efforts were mounted. Particularly noteworthy was the MIDWAY silver-zinc-lead property, where REGIONAL RESOURCES spent $2.3 million in an aggressive exploration program that included 11 735 metres of drilling. Other major programs are outlined in the highlights below.

In the coal sector, major exploration programs were mounted only on the MT. KLAPPAN and TELKWA deposits in the northwest part of the Province. Exploration also continued at or near major deposits that had recently come on stream in the southeast and northeast coalfields. Two major northeast coal producers, DENISON'S QUINETTE and TECK'S BULLMOOSE, began shipping late in the year. In the southeast, two mines which had begun production in 1981, KAISER'S GREENHILLS and CANADA DEVELOPMENT CORP.'S LINE CREEK, were officially opened in September, 1982.

Uranium mines [illegible] in 1982. A parable exists between the record level of exploration and the low metal prices that is only partially explained by relatively high uranium metal prices. The producing mines were the scene of [illegible] activity, three closed permanently, but there were two new openings. RAINCHEVIER closed the [illegible] in the Lower Cretaceous Dakota Sandstone of the Grants Mineral Belt, New Mexico after 17 years of production. QUESTA MINE reopened its molybdenum [illegible] for early 1984. Also late in the year, [illegible] began mining gold ore in the Dockyard area after only three years of operation. This mine, however, has provided valuable infrastructure that has facilitated the Dockyard area continuing to be one of the most active exploration areas for precious metal deposits in 1983. In the north, NEWMONT'S GALORE CREEK copper-zinc mine and [illegible] VALLEY COPPER mine came into production in 1981.

Some particularly significant results of 1982 exploration are:

(1) The WINDY-CRAGGY prospect of FALCONBRIDGE NICKEL and GEDDES RESOURCES was confirmed as a world-class volcanogenic copper-cobalt deposit. Late in the season, substantial intersections with significant gold values were encountered in some drill holes.
(2) The MIDWAY carbonate-shale-hosted silver-zinc-lead massive sulphide deposit of REGIONAL RESOURCES was the target of a major drill program which greatly expanded the mineralized area and substantially boosted its reserves and potential.
(3) A substantial exploration and land acquisition program at the ERICKSON GOLD MINE in the Cassiar District has contributed substantially towards making this a major vein gold camp.

(4) JEREMY'S LAWYERS property in the Toodoggone district has been successful in enlarging tonnage. A second adit will be driven in 1984.

(5) The PREMIER-BIG MISSOURI and the KUTTIE GOLD MINE areas north of Stewart were again the focus of intensive precious metal exploration.

(6) A substantial diamond-drill program by ESPERANZA-LA TEKO RESOURCES at the TILLICUM MOUNTAIN gold prospect was followed late in the year by the decision to proceed underground for more detailed exploration.

(7) The UPPER HORSEFLY-EUREKA PEAK area in the Cariboo district was the site of considerable exploration activity for gold.

(8) A new gold-silver base metal massive sulphide discovery was made west of Adams Lake late in the year. It sparked a major staking rush and resulted in an immediate drill program by CORPORATION FALCONBRIDGE COPPER on the original discovery, known as ADA GOLD.

(9) Continued exploration by WESTMIN RESOURCES on their Hettle Lake property resulted in a further expansion of the H-W ZONE, and in the discovery of an extension zone west of the LYNX MINE.

(10) EAGLE PLACERITE continued underground exploration of their fluorite-silver deposit on Quesnel Lake.

(11) A major drill program by CROWS NEST RESOURCES on their TELKWA coal property brought this deposit of thermal coal a step closer to production.

(12) GULF CANADA RESOURCES continued exploring their MT. KLAPPAN anthracite deposit in the Groundhog Coalfield and are reported to be close to a major production decision.

This report on exploration is arranged according to activity in each of the seven District Geologists' areas. A separate section is devoted to industrial mineral exploration. A short summary of field activities and major planning programs in aid of exploration by the Ministry's Geological Branch is also included. Mineral claim and exploration expenditure statistics were supplied by the Ministry's Titles Branch and by the B.C. and Yukon Chamber of Mines. The report was compiled by V. A. Preto and M. M. Smyth who gratefully acknowledge the cooperation of these agencies and individuals.

NORTHWESTERN DISTRICT – T.G. Schroeter, District Geologist, Smithers

INTRODUCTION

EXPLORATION

Minerals

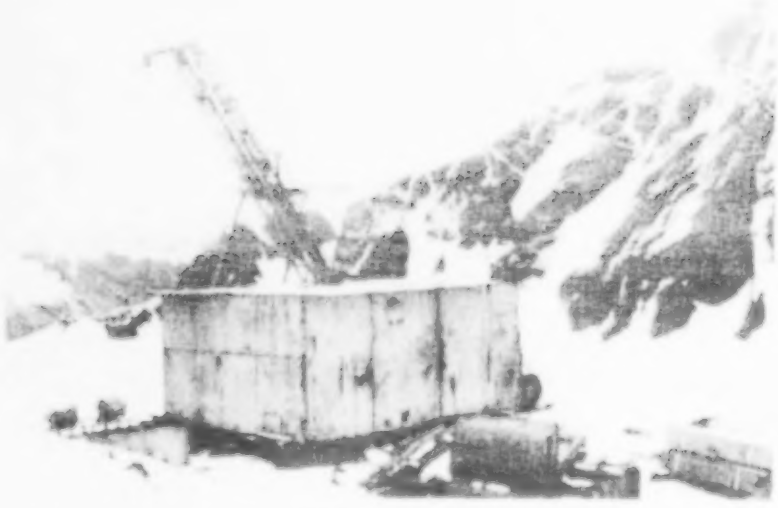


Photo 1. Summer diamond drilling at the Windy-Craggy copper-cobalt deposit. Indicated resources 216 million tonnes at 1.50 per cent copper, 0.4 gram/tonne gold and 0.1 gram/tonne silver.

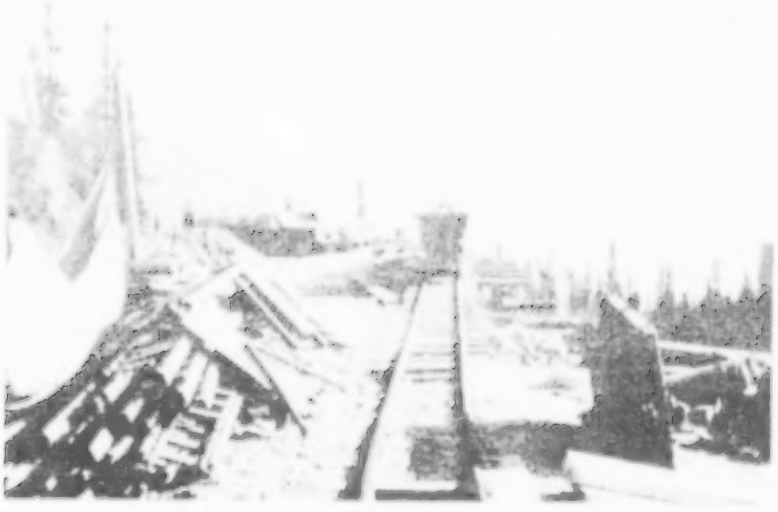


Photo 1. Portal, Dickson gold mine. Current estimated reserves 134 000 ounces at 16.36 grams of gold per tonne.

DUPONT drilled two holes totalling 138 metres on the PEL CLAIMS located just northeast of the Baker mine. On the BILL CLAIMS (110), located 135 kilometres southeast of Dease Lake, DUPONT drilled six holes totalling 1 175 metres on a gold-arsenic anomalous zone.

In the STEWART AREA, WESTMIN RESOURCES completed 17 drill holes totalling 709 metres on the BIG MISSOURI precious and base metals prospect (11) (mainly on the Martha Ellen Zone), and 24 drill holes totalling 2 741 metres on the SILBAK PREMIER precious and base metals prospect (12) (under option from BRITISH SILBAK PREMIER). Most of the drilling was done in the area of the Glory Hole. Results from both programs are sufficiently encouraging to expect significant programs in 1984. Exploration by ESSO MINERALS CANADA LTD. south of the Granduc millsite (13) included two drill holes totalling 184 metres on the INDIAN PROSPECT and three drill holes on the WOODBINE PROSPECT. On the SILVER BUTTE precious and base metals prospect (14), which adjoins the Big Missouri property to the west, ESSO MINERALS CANADA LTD. completed 13 drill holes totalling 1 680 metres. Further north, approximately 65 kilometres northwest of Stewart, ESSO MINERALS CANADA LTD. completed 10 diamond-drill holes totalling 1 341 metres on the SULPHURETS (15) BRUCEJACK LAKE gold-silver zones of mineralization. SCOTTIE GOLD MINES LTD., under agreement with GOLDCORP INVESTMENTS LTD., undertook a comprehensive underground and surface exploration diamond drilling program to expand and develop additional ore reserves hosted by massive pyrrhotite zones at the SUMMIT LAKE GOLD MINE (16). To mid-December, 80+ metres of underground diamond drilling in eight holes had been completed from the 1800 level on the 'D' ZONE. Some significant gold assays have been retrieved. Underground drilling on the 'D' zone continues. In addition, 951 metres of surface diamond drilling in 5 holes have been completed on the 'N' ZONE where all present drilling is taking place. 'D' ZONE is 924 metres north of the main workings and 'O' Zone, all with encouraging results. Approximately 150 kilometres of airborne geophysics has also been carried out over the entire claim group. At TENAJON SILVER CORP.'s TINA CLAIMS (east north of the Summit Lake gold mine) (17), numerous new gold veins were outlined as well as aerial geophysical anomalies which suggest the presence of bottle-type pyrrhotite gold deposits. An extensive program of trenching and diamond drilling is planned for 1984. At the PROSPERITY/FORTUNE (18) silver property, located 4 kilometres southeast of Stewart, PACIFIC CASSIAR LTD. rehabilitated some 762 metres of drifts on two levels of the Prosperity vein for mapping, sampling, and percussion drilling of 90 9.14-metre-long test holes. Several mineralized veins were discovered by prospecting in areas exposed by retreating ice. New outcrops on the ANGESO and 8 VEINS returned good results.

At the EQUITY SILVER MINE (19), EQUITY SILVER MINES LTD. conducted approximately 1 000 metres of overburden trenching, followed by approximately 2 000 metres of diamond drilling south of the SOUTHERN TAIL orebody to test a copper-silver-zinc soil anomaly. On the BOX CREEK property (20), located approximately 12 kilometres south of Houston,

SELCO (under an option agreement with COMINCO), completed 10 diamond-drill holes totalling 1 568 metres to test the precious and base metal potential of a large clay-sericite-silica-carbonate-pyrophyllite alteration zone in Jura-Cretaceous acid and intermediate flows and pyroclastic rocks.

In the TROITSA-WHITESAIL LAKE AREA (21), located approximately 120 kilometres south of Houston, several companies conducted exploration programs for precious metals over a large area. More than 3 000 units have been staked during the past year. In particular, CANAMAX conducted geochemical and geophysical surveys and completed 1 600 metres of diamond drilling on their CALDERA PROPERTY which covers a weak stockwork zone of epithermal auriferous quartz-arsenopyrite veins. Work was also carried out on their TROITSA PEAK epithermal prospect.

On the QUEEN CHARLOTTLE ISLANDS, MAJOREM MINERALS drilled 28 holes on their HIGHGRADE gold prospect (22) where a mineralized zone has been traced for more than 1 500 metres. HOMESTAKE drilled five holes totalling 539 metres on the INCONSPICUOUS epithermal gold-silver prospect (23).

Coal

Aggressive exploration programs were carried out on three areas in northwestern British Columbia. On the TELKWA PROPERTY (24), CROWS NEST RESOURCES LTD. excavated a test pit and removed 140 000 banked cubic metres of material to expose nine of the seams in the section. Fifteen bulk samples of coal were shipped to Calgary for washability tests. Fifty-three NQ diamond-drill holes were completed totalling 6 000 metres. Four 15.2-centimetre-diameter drill holes were completed to provide large samples for washability tests. CROWS NEST RESOURCES LTD. also completed one drill hole on the ZYMOETZ property (25) and one drill hole on the DENYS PROPERTY (26). SUNCOR conducted two field programs. On the SUSTUT property (27), located approximately 10 kilometres east of Bear Lake, seven holes totalling 1 464.2 metres were drilled. On the MT. JACKSON PROPERTY (28), mapping and trenching were carried out, measuring and sampling coal seams. GULF CANADA RESOURCES began underground exploration of the MT. KLAPPAN anthracite deposit (29). They completed 729 metres of diamond drilling, 81 trenches excavated in coals seams, and a 35-tonne bulk sample was taken from an underground adit driven in one of the 5-metre coal seams. The 1983 program has added a substantial tonnage to the Mt. Klappan deposit which may be capable of producing in excess of 5 million tonnes of coal per annum at favourable strip ratios. D. GROOT

LOGGING completed 17 diamond-drill holes totalling 1 948 metres on their SEELY LAKE COAL prospect (30), located 10 kilometres south of Hazelton.

NOTICES OF WORK ON MINERAL CLAIMS

The number of notices of work on mineral claims, Form 9-10, filed to December 1983 is comparable to 1982 but is down approximately 42 per cent from 1981. The 'advanced' or drill programs are up 63 per cent from 1982 but down 17 per cent from 1981.

Mining Division	1983				1982				1981			
	Min.	Coal	Drill	Placer	Min.	Coal	Drill	Placer	Min.	Coal	Drill	Placer
Atlin	20	-	8	80	34	-	3	108	25	-	7	66
Liard	21	1	9	55	21	-	7	17	33	-	9	2
Omineca	78	6	23	1*	54	3	14	2*	99	3	24	3*
Skeena	30	-	18	1	32	-	13	1	105	-	30	3
Total	149	7	58	137	141	3	37	123	262	3	70	76

*Does not include Omineca (Germansen Landing area) gold field.

DEVELOPMENT

None of the major prospects are in the development phase although LAWYERS and PORTER IDAHO are very close to being so. Development is proceeding at the ERICKSON GOLD MINE, SUMMIT LAKE GOLD MINE, and the CASSIAR asbestos mine.

PRODUCERS

(1) ERICKSON GOLD MINE (6) is operating at approximately 180 tonnes per day with potential for up to 450 tonnes per day in the near future.
(2) CUSAC INDUSTRIES (6) is operating at approximately 35 tonnes per day with potential for more.
(3) TAURUS MINE (6) is operating at 135 tonnes per day.
(4) CASSIAR ASBESTOS MINE (6) is operating at about 90 000 tonnes per year. Pre-feasibility studies on underground mining of the new McDame deposits are continuing.

(5) BAKER MINE (9) produced at 90 tonnes per day for most of 1983. Mining ceased at the end of October 1983, milling ceased at the end of November 1983, and the mine closed in December 1983.

(6) EQUITY SILVER MINE (19) is operating at approximately 5 700 tonnes per day. Mining in Southern Tail Zone is almost complete. Stockpiling of ore from Main Zone pit began in the third quarter of 1983 with mill feed scheduled for late 1983.

(7) GRANDUC MINE (13) is operating at approximately 3 575 tonnes per day. Development work ceased in early 1983 and the mine is officially scheduled to close in July 1984.

(8) SUMMIT LAKE MINE (17), Scottie Gold Mines Ltd. is operating at approximately 180 tonnes per day. Surface and underground diamond drilling, as well as successful prospecting, have yielded encouraging results which should increase reserves considerably.

(9) BELL COPPER MINE shut down in mid-1982. It reopened in late October 1983 for a stripping program.

(10) GRANISLE MINE, porphyry copper-molybdenum deposit is closed indefinitely.

(11) The BENAKO MOLYBDENUM MINE is closed indefinitely.

(12) The KITSAULT MOLYBDENUM MINE is closed indefinitely.

(13) TAKU MINE, closed permanently on October 31, 1983 after 17 years of operation.

(14) DUTHIE MINE operated infrequently in 1983. The operator is building a 45-tonne per day mill.

(15) SILVER STANDARD GOLD-SILVER MINE is closed. It operated infrequently during early 1983 but closed due to low metal prices.

(16) FREE GOLD MINE (DOME MOUNTAIN) did not operate in 1983 but mining is planned for 1984.

(17) CRONIN MINE did not operate in 1983 but exploration and development is planned for 1984.

NORTHEASTERN DISTRICT - A. Legun, District Geologist, Fort St. John

INTRODUCTION

Coal exploration activity in the Northeastern District was subdued in 1983 due to a continuing depressed world market for coal. Expenditures were down, with the exception of ESSO RESOURCES CANADA LTD., and many companies stood by existing work credits on their coal licences, for example, UTAH MINES. Exploration activity was focused on the Pine Pass region west of Chetwynd. The largest single program, however, was south

of the Sukunka River at QUINTETTE'S McCONKEY MINESITE (37). Here drilling identified an additional 13.4 million tonnes of reserves in peripheral areas.

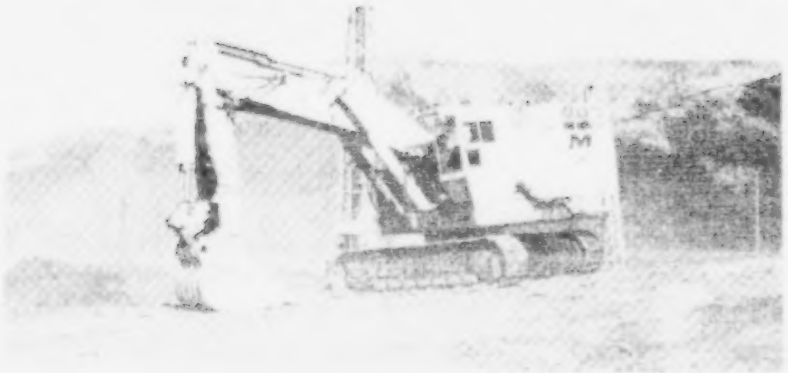


Photo 4. Teck's Bullmoose mine; 16-cubic-metre hydraulic excavator. Coal shipments began December 1, 1983.

EXPLORATION

In the north at MOUNT JOHNSON (31) by Peace River Canyon, CINNABAR PEAK MINES drilled three holes totalling 500 metres to further define reserves in the Trojan and Milligan seams of the Gething Formation. Immediately north of the Pine River (32) GULF CANADA RESOURCES obtained good coal intersections in three drill holes on their Moberly licences. Nearby, CROWS NEST RESOURCES LTD. (33) drilled one hole and extensively trenched at Noman Creek. South of the Pine River ESSO RESOURCES CANADA LTD. (34) drilled seven holes on their FALLING CREEK property and intersected very thick seams but with limited areal preservation. Further south TECK CORPORATION LTD. did a preliminary geological reconnaissance of newly acquired licenses in the ROCKY CREEK AREA (35).

South of the Sukunka River QUINTETTE COAL LTD. undertook 5 000 metres of rotary drilling on the periphery of McCONKEY MINESITE (37) and confirmed

a dip slope extension to their J seam as well as a mineable repeat of Gates Formation coals below the Mesa thrust. QUINTETTE also drilled at MOUNT HERMAN, immediately to the south and on the Dupont licenses to the east. This work resulted in a good intersection of E & J seams on the former property, which is estimated to contain 3.1 million tonnes.

The only activity south of the Murray River was at SECUS MOUNTAIN (38) where CROWS NEST RESOURCES LTD. completed one drill hole.

Photo 5. Quintette's McConkey mine. Pit and office of Quintette's McConkey mine. Coal shipments began December 1, 1983.

MINE DEVELOPMENT

Both QUINTETTE'S McCONKEY and TECK's BULLMOOSE mines (36) began shipping coal to the Ridley Island terminal by December 1. Teck has not substantially altered initial plans of pit development while QUINTETTE has switched initial production from the DEPUTY to the MARMOT and MESA PIT areas. In the coming months Quintette's main concern will be minimizing waste rock in mining variably dipping seams. Teck will be concerned with the boundary between oxidized and non-oxidized coal where their shallow-dipping seams intersect the ground surface.

CENTRAL DISTRICT - E. L. Faulkner, District Geologist, Prince George

INTRODUCTION

There was a general increase in mineral exploration activity in most of the district in 1983, with 27 per cent more Notice of Work on a Mineral Claim, Form 9-10, submitted than in 1982. There were a few "grass roots" exploration programs, a modest increase in drilling, and more prospectors and junior companies active this year. The majority of programs continued to be low budget. Exploration targets continued to be precious metals for the most part, especially vein or massive sulphide-hosted gold, and polymetallic deposits with significant precious metal values. The strong interest in industrial minerals shown in 1982 continued, but too many companies have tried to enter the agricultural limestone market, and most have ceased operation or are in financial difficulties. Placer operations were down 17 per cent from 1982, in response to the comparative stability of gold prices.

EXPLORATION

Minerals

The Cataga-Chukwa Ranges area was the only one in the district with reduced exploration activity, following the indefinite shelving of CYPRUS ANVIL'S plans for the CIRQUE DEPOSIT (shale-hosted base metal-silver) (39). NORANDA and COMINCO were still active, with NORANDA conducting ground E.M. and some limited drilling on several properties in the CATAGA RIVER area (40), while COMINCO carried out geochemistry and geophysics on widely separated properties in the OSPIKA RIVER basin, and south of the Cirque deposit.

In the Omineca, exploration targets were gold and, further north, Midway-type base metal-silver mineralization. GOLDEN PORPHYRITE LTD., headed a group of junior companies in staking more than 2200 units in the VITAL RANGES (41) looking for bedrock sources of the placer gold. ANACONDA continued its option on GOLDEN RULE'S MANSON RIVER property (42), with a percussion drilling program to test a large bedrock gold geochemical anomaly. Nearby, TAIGA CONSULTANTS LTD., continued examining the PLUME property (43). Other companies active in the Omineca were ASARCO, with a mapping program on the LAU property near Germansen Lake, GOLDEN RULE RESOURCES, with a re-examination of the old POLARIS property (44), and CANAMAX, who conducted geochemical surveys on several properties in the LAY CREEK and SWANNEL RIVER area.

In the Cariboo, exploration activity was high in the Mesozoic meta-volcanics of the Quesnel Trough, and in the adjacent Hadrynian metasediments. There was somewhat less activity in the Mississippian Slide Mountain Group. Over 80 Notices of Work on a Mineral Claim, Form 9-10, were filed, mostly low-budget programs. Targets were gold in quartz veins, associated with pyrite in massive volcanogenic sulphide deposits, or with porphyry-hosted base metal mineralization. PLACER continued with extensive geochemical and geophysical work and some limited drilling on their MEGABUCK property (45), while ARCHER-CATHRO concentrated on geochemical work on the RAVIOLI property immediately to the south. DOME continued drilling the newly discovered WEST ZONE on their QUESNEL RIVER property (46), where published reserves are 862 000 tonnes of 7.2 grams per tonne, porphyry-related gold. Results so far are encouraging, and further drilling is under way. Other companies with larger programs of geochemistry, geophysics, and some percussion drilling or trenching were E & B on their JAMBOREE PROJECT (47), CAROLIN MINES in the LIKELY AREA (48) and CANADIAN MINERAL CORP. near MT. TOM (49). Major companies with modest programs on a number of smaller properties throughout the area were NORANDA, SELCO and NEWMONT.

AMOCO, late in the season, announced finding visible gold in core from five holes on their MACKAY RIVER property (50) optioned from EUREKA RESOURCES. The gold is in Upper Triassic phyllites of the Quesnel Trough, either disseminated or possibly associated with small quartz-pyrite-carbonate lenses. Some of the assay results were lower than had been expected, and are currently being checked. This news sparked a staking rush in the area, and some late-season exploration by several companies, including MT. CALVERY RESOURCES at McKEE LAKE and J.M.T. SERVICES.

Elsewhere in the Central District, a few companies, including ELDOR and MINEQUEST on the FRASER PLATEAU, and HOMESTAKE and some junior companies in the CHILKO LAKE-NIUT RANGE area, conducted "grass roots" programs for epithermal gold or porphyry-hosted base metal-gold deposits. SUNCOR continued with mapping, geochemistry and geophysics on their extensive TCHAIKAZAN RIVER property (Fig. 4, No. 52) and completed eight drill holes on the first of a number of targets. Other work in the southwest part of the district consisted of a number of small budget programs re-evaluating older properties, mostly by junior companies, in the TASEKO LAKES and UPPER TASEKO RIVER area.

Coal

The only exploration for coal in the district was a program of five drill holes announced by NORCO on their BOWRON RIVER property (51).

NOTICES OF WORK ON MINERAL CLAIMS, FORM 9-10

As of the end of November, a total of 645 Form 9-10's were submitted; 110 Mineral and Quarry and 535 Placer.

DEVELOPMENT

NORANDA (HEATH-STEELE) dropped their option on BARRIER REEF'S BLACKDOME (53) gold property after underground development work this summer, and prior to a production decision called for in the Spring of 1984.

PRODUCERS

Gloomy news continued from the producing mines in the district. ENDAKO continued on indefinite shutdown, GIBRALTAR continued with reduced production from their copper-molybdenum mine by working stockpile and high-grade pit ore. BOSS MOUNTAIN molybdenum mine began to dispose of equipment and facilities, and MOSQUITO CREEK GOLD MINES shut down mining and milling operations for an indefinite period, although some underground drilling and development will continue in an attempt to build up ore reserves.

SOUTHEAST DISTRICT - D. A. GRIEVE, District Geologist, Fernie

INTRODUCTION

Exploration for all commodity groups in the Southeast District is down from 1982. Reductions in prices received for metallurgical and thermal coal, and continued relatively low demand for export coal, are the major external factors affecting exploration in the district. Despite these influences, WESTAR'S new GREENHILLS MINE made its first shipment of clean metallurgical coal in July. The official openings of the GREENHILLS MINE and CROWS NEST RESOURCES' LINE CREEK MINE took place in September.

EXPLORATION

Coal

Exploration is down from 1982's already depressed level. An interesting new trend is the exploration for coals of higher volatile contents than the southest's standard metallurgical and thermal products. This appears to be the main impetus behind two of WESTAR'S exploration programs. Work at COAL CREEK (54), an old mining area immediately east of Fernie, involved driving and bulk sampling of eight adits in the uppermost three seams in the stratigraphic section. Work at NATAL RIDGE (55), adjacent to Westar's Harmer Ridge operations, also focused on the uppermost seams. Here bulk sampling of six adits was supplemented by approximately 50 rotary drill holes.

FIGURE 4
MAJOR EXPLORATION PROPERTIES
SOUTHERN BRITISH COLUMBIA, 1983

52. TCHAIKAZAN RIVER (Cu, Mo, Au)
53. BLACKDOME (Au, Ag)
54. COAL CREEK (Coal)
55. NATAL RIDGE (Coal)
56. LINE CREEK EXTENSION (Coal)
57. EAGLE MOUNTAIN (Coal)
58. BYRON CREEK (Coal)
59. TILLICUM MOUNTAIN (Au)
60. SYLVESTER K (Au)
61. HIGHLAND VALLEY RESOURCES (Au)
62. BAYONNE MINE (Au, Ag)
63. REFERENDUM MINE (Au, Silica)
64. ASPEN (Ag)
65. HECLA–JOHNSBY (Ag, Pb, Zn)
66. LITTLE TIM (Ag, Pb)
67. AYLWIN (Cu, Au, Ag)
68. MOYIE RIVER (Au)
69. REA GOLD (Au, Ag, Cu, Pb, Zn)
70. J & L (Au)
71. REBAR–SHERPA (Zn, Pb)
72. MURRAY (Cu, Pb, Ag)
73. MOW (Cu)
74. TOP (Cu, Ag)
75. ORELL RESOURCES (Pb, Zn, Au)
76. TOP (Au)
77. CHU CHUA (Cu, Au)
78. SILVER QUEEN (Pb, Zn, Ag)
79. BANBURY (Au)
80. MASCOT GOLD (Au)
81. DOCTORS POINT (Au, Ag)
82. RN MINE (Au)
83. DOROTHY–I AM (Cu, Zn, Au, Ag)
84. LI–LI–KEL (Ag, Pb, Zn, Au)
85. CAROLIN MINE (Au)
86. SLUMACH (Au, Ag, Cu, Zn)
87. ICE AND YALAKUM (Au, Ag, Cu)
88. OK (Cu, Mo, Ag)
89. ALEXANDRIA (Au, Ag)
90. CLIFF (Cu, Au, Ag, Mo, Pb, Zn)
91. MT. WASHINGTON (Au, Ag, Cu)
92. ZEBALLOS (Au)
93. SIN (Au, Ag, Cu)
94. AU CLAIMS (Au, Ag)
95. MT. SICKER (Cu, Zn, Au, Ag)
96. THISTLE (Cu, Au, Ag)
97. VALENTINE MTN. (Au)
98. SOVBRIO POINT (Placer Au)
99. QUINSAM (Coal)

On LINE CREEK EXTENSION (56), immediately north of Line Creek Mine, CROWS NEST RESOURCES drilled 13 diamond drill holes and four rotary drill holes and excavated test pits in two of the upper seams.

FORDING drilled 24 rotary holes in Kilmarnock Creek area (57), adjacent to their major EAGLE MOUNTAIN development. Adits on Eagle Mountain in two of the lower seams were sampled.

BYRON CREEK COLLIERIES completed 128 rotary holes and six diamond-drill holes on Coal Mountain (58). Small drilling programs were also carried out by CROWS NEST RESOURCES on HARVEY CREEK property and by UTAH on the BINGAY CREEK property in the latter part of the year.

Minerals

Seven Notice of Work on a Mineral Claim Form 9-10 were filed. None of the projects appears to be significant at this stage.

DEVELOPMENT

The EAGLE MOUNTAIN development of Fording is well underway, with coal being mined from new pits in lower seams on the east side of the mountain, and barren rock being removed from above the uppermost seam on the peak.

WEST KOOTENAY DISTRICT - G. G. Addie, District Geologist, Nelson

INTRODUCTION

Using Notice of Work on a Mineral Claim, Form 9-10, as an index, there was an increase of approximately 100 per cent in mining activity compared to last year. Exploration was focused on gold and centred on Tillicum Mountain, Grand Forks, and Nelson.

EXPLORATION

New discoveries of visible gold continue to be made at ESPERANZA EXPLORATION LTD. and LA TEKO RESOURCES LTD.'s TILLICUM MOUNTAIN (59)

prospect. An underground bulk sample test was taken on the "East Ridge" zone during November.

Photo 6. Diamond drilling at Esperanza-La Teko's Tillicum Mountain gold property, August 1983.

Of particular significance from the point of view of geology are the new finds of low-grade gold, and silver deposits in metasediments. Adjacent properties have also located this type of mineralization. HAILSTORM EXPLORATION LTD., owned equally by SUNCOAST PETROLEUM CORP. and ROXWELL GOLD MINES LTD. on Hailstorm Ridge, have trenched a zone 13.3 metres wide averaging 350 grams silver per tonne. MAR GOLD RESOURCES LTD. have completed six diamond holes on the MOUNTAIN MEADOWS property in the Tillicum Gold camp to prove a 133-metre gold-bearing strike length. It is estimated that the 1980 TILLICUM discovery by prospectors ARNIE and ELAINE GUSTAFSON, who were at that time the recipients of a $2000 Prospectors Assistance grant, has caused more than $5 million to be spent in the area to date.

In the Grand Forks area KETTLE RIVER RESOURCES have completed a program of VLF-EM survey, trenching, and diamond drilling on their SYLVESTER K property (60) situated north of the old Phoenix copper mine. The mineralization is massive sulphides with gold in an argillite host rock. Surface sampling has indicated this zone to be 267 metres long and 4 metres wide. There are complications at depth with the mineral zone either faulted off or pinched out due to facies changes. However, three other zones remain to be tested and the main zone may be longer as indicated by "self-potential" tests. Selected gold values range from 9.37 to 12.5 grams gold per tonne. A total of $600,000 was spent on this property during 1983. At Jewel Lake, DENTONIA RESOURCES LTD. has upgraded surface and underground facilities. Adjacent to this property (61) HIGHLAND VALLEY RESOURCES LTD. have prepared a decline on the MAX claim and are also arranging new financing. South of the old Phoenix copper mine, CONSOLIDATED BOUNDARY EXPLORATION has given options to SJ RESOURCES LTD. to acquire 50 per cent interest of the WINNIPEG and GOLDEN CROWN MINES and the HEK and NAL property for a total of $700,000 and 35,000 SJ shares. MUNDORE MINES also has an option to acquire 40 per cent of the GOLDEN CROWN MINE for $800,000 through 1986 plus 100,000 Mundore shares at 25,000 shares per year. All these are gold prospects.

In the Nelson area a number of old mines have re-opened or are being prepared to re-open. The BAYONNE MINE (62) was operated during the summer by GOLDRICH RESOURCES. The PEARLSTON ZINC (63) mine was processed successfully for its silica content by prospector Tom Cherry of Nelson. He has also discovered a 3-metre-wide vein with visible gold on his adjacent claim TECGOLD. Across the valley, (49 Mile Creek), KUPPIN RESOURCES INC. have signed a letter of intent with PLAYER PETROLEUM INC. to open the MAY and JENNIE MINE. On Conner Creek S. Peatty has an option from DONAMEX MINERALS on his ROOT gold claims. He also has an option from BIOCANEX INC. on his BELY claims (gold) on Beaverdale Creek. To the east of Nelson, prospector Mike Budock reports an option from GEOTEX RESOURCES INC. and TUNSTALL RESOURCES INC. on his LASSA CREEK gold property. HOST VENTURES LTD. own 90 per cent of the SILVER KING MINE (gold silver) near Nelson and have indicated a 100-metre extension of the Iroquis vein stucture by diamond drilling. At Stewart Creek, near Ymir, SELCO INC. drilled four 4 holes for a total of 1 677.3 metres. Further work is planned next summer.

ARIZAKO MINES LTD. has acquired a 75 per cent interest in the YANKEE GIRL MINE (gold) and the DUNDEE MINE from BURLINGTON GOLD MINES LTD., along with three other companies. ARIZAKO MINES has a letter of intent with DAVID MINERALS to lease the H.B. MILL at Salmo. They also intend to open the CENTRE STAR MINE. South of Salmo, CHOPPER MINES have an agreement to earn 60 per cent of EXTOTAL RESOURCES INC.'s ASPEN MINE (silver) (64).

TRI BASIN RESOURCES LTD., in a joint venture with NEW JERSEY ZINC EXPLORATION COMPANY LTD., expect to earn 50 per cent interest with the completion of $1 million in exploration and development on the JACKPOT lead-zinc property. CHUTINE RESOURCES have an agreement with DAVID MINERALS mill at Salmo to process material from the ARLINGTON GOLD MINE on Erie Creek. The SPRINGLAKE RESOURCES LTD. and GOLDBELT MINES LTD. joint venture was formed to explore Goldbelt's 29 claim QUEEN MINE property. By spending $500,000, Springlake would acquire 80 per cent interest on the property. An option has been obtained by Ken Murfitt from TECK CORPORATION on the YMIR-GOODENOUGH MINE.

In the Slocan area other mines also plan to re-open. WAVECREST RESOURCES LTD. have entered into a joint venture agreement with SPRINGPOINT RESOURCES LTD. to explore the CORINTH MINE (silver, lead, zinc). DICKENSEN MINE is exploring the HECLA-JOHNSEY (65) silver-lead-zinc property. NEW DENVER SILVER has completed a long drive and successfully intersected the WONDERFUL MINE silver vein. At the LITTLE TIM MINE (silver-lead) (86) prospector Matt Nebo has obtained an option from SEAGIT MINING LTD. who have established a new gravity mill on the property. CROPPER MINES have also indicated that they intend to open the SILVERCUP COMSTOCK MINE. The Aylwin Creek (67) joint venture of KELCO INC. and SIDCANEX INC. continues with the drill program; 1 340 metres were drilled in six holes. This is a molybdenum-gold porphyry type deposit which has important geological implications for the Slocan mining camp. Indicated reserves are 3 million tonnes average 0.4 per cent copper, 1.5 grams gold per tonne, 0.6 grams silver per tonne. The ST. CLAIR MINING CO. have been doing development work on the CHAMBERS MINE (silver). The owner of this property is SILVEX RESOURCES CORP. AMHAWK RESOURCES CORP. now own the FREDDIE LEE (silver) zinc, and hope to re-open it soon. ALMINE RESOURCES LTD. report gold on the LYLE CLAIM in feldspar porphyry dykes and plugs and in metabasalt of the Kaslo Formation adjacent to those intrusions. PETROMIN RESOURCES CORP. had agreed to acquire control and to provide funding to ALFO EXPLORATION LTD. and HOKO EXPLORATION LTD. who hold the WESTMONT MINE (silver).

In the Golden area, STATESIDE ENERGY CORPORATION have continued their exploration on the CRYSTAL CREEK prospect near the Ruth Vermont mine. The second phase exploration program calls for an expenditure of $100,000.

In the Beaverdell area CANSTAT PETROLEUM have completed approximately 400 metres of diamond drilling in nine holes on its WAMBAT silver-gold-copper prospect. Two other zones, the FRAN silver area and MAY-KID silver-lead-zinc anomaly remain to be tested.

In the Ainsworth area, CHOPPER MINES LTD. report a gold-silver-lead-zinc find on its WHEELER LAKE property, 16 kilometres west of Ainsworth. In the Cranbrook area, WARSTAR RESOURCES have agreed to acquire 50 per cent interest of KMS RESOURCES LTD. (68) in three contiguous claims covering the MOYIE RIVER GOLD MINE (placer gold).

LEVEL OF ACTIVITY DERIVED FROM NOTICES OF WORK ON MINERAL CLAIMS, FORM 9-10

	1981	(Under-ground)	1982	(Under-ground)	(DD)	1983 (To Dec.15)	(Under-ground)	(DD)
PLACER	38	-	35	-		49	2	
GOLDEN	23	1	25	5	5	14	-	5
SLOCAN	73	24	32	10	5	61	11	16
AINSWORTH	8	1	-	-	-	8	-	3
GRAND FORKS	25	3	8	2	2	32	-	12
MOUNT STEELE	26	-	10	-	2	25	-	7
LARDEAU	11	2	3	1	-	12	-	3
[illegible]	51	9	28	3	7	66	4	12
[illegible]	3	1	4	2	2	7	-	1
[illegible]						14	0	1
	262	41	145	23	23	290	18	58
Increase or decrease over previous year	-13%	-36%	-45%	-44%		+100%	-22%	+152%

NOTES:

(1) While there has been a great increase in exploration activity in this area, the number of operating mines has decreased.
(2) The Slocan Mining Division statistics now include the Tillicum Mountain gold mining camp. Fourteen 9-10's or 23 per cent of the Slocan forms are from this camp.
(3) The figures for diamond drilling are for "proposed" work. Possibly only 50 per cent of this work was accomplished due to lack of financing.

DEVELOPMENT

The TILLICUM MOUNTAIN, SYLVESTER K, and AYLWIN CREEK properties are at a fairly advanced stage of exploration and with continued exploration success could reach the production decision stage in the near future. In the Nelson-Slocan area, a large number of former gold, gold-silver, and silver-lead small producers are under re-assessment.

PRODUCERS

Production continued at the SULLIVAN, HALLMAC, and HIGHLAND BELL mines. The WHITEWATER and LITTLE TIM mines have recently been re-opened with limited production. The DICKENSON MINE, BAYONNE MINE, MOYIE MINING, BLACK PRINCE and TWO FRIENDS, and the REFERENDUM are closed for the winter months.

SOUTH CENTRAL DISTRICT - G.P.E. White, District Geologist, Kamloops

INTRODUCTION

The level of exploration activity in this district was at a low level, similar to 1982, until the new Hilton polymetallic massive sulphide showing west of Adams Lake created a spate of staking and exploration programs.

EXPLORATION

The new Hilton showing [REA GOLD (69)] west of Adams Lake is currently being drilled by CORPORATION FALCONBRIDGE COPPER. This gold-silver-copper-lead-zinc massive sulphide showing is stratabound in an overturned breccia pipe, rhyolite, and sedimentary sequence. All of NTS 82M/4W and a large part of 82M/4E and 82M/5W have been covered by mineral claims, in some cases more than once. KAMAD SILVER to the southeast of the Hilton showing are also diamond drilling for a possible extension of the Hilton prospect. SELCO continued a program of surface and subsurface exploration for gold on the J & L property along Carnes Creek (70) north of Revelstoke. NORANDA have optioned the Sherpa and Rebar claims in the Mable Lake-Tsuius Creek area (71) southwest of Revelstoke. Stratabound sphalerite is present in Shuswap terrane. On the MURRAY CLAIMS, west of Galena Bay (72) and south of Revelstoke, a new copper discovery is situated in a possible volcanogenic environment in schists of possible Lardeau Formation. At the time of writing no options had been signed on

this property. CANAMAX [MOW (73)] carried out surveys on a copper discovery southeast of Mowich Lake in the Deadman Creek valley northwest of Kamloops. Cuprite and native copper are present in Triassic volcaniclastic rocks. Listwanite is also present on the claims. CANAMAX mapped the TOP claims (74), a chalcopyrite-bornite showing in possible mid-Paleozoic volcanic rocks northwest of Falkland. NORANDA have optioned the claim holdings of ORELL RESOURCES (75) on Adams Plateau north of the west end of Shuswap Lake. KERR ADDISON are examining the TOP claims (76) for gold in altered granite and altered latite dykes in the Monashee Pass area. CRAIGMONT's intended deep hole drilling on the CHU CHUA (77) massive sulphide copper body southeast of Clearwater was suspended in mid-program. RAMPART MINES drifted for 125 metres on the SILVER QUEEN (78) lead-zinc-silver deposit along Cottonwood Creek in the Stein River area.

DEVELOPMENT

BANBURY MINES (79) in the Hedley area continue an underground program of drifting and drilling. Similarily, MASCOT GOLD (80) in the Hedley area now have carried out an extensive program and would appear to be in a holding pattern. KAMAD SILVER have shipped rock from their Skwaam Bay operation to Dankoe Mines. These three foregoing properties relate to precious metal deposits with or without accompanying other metallic elements and barite at the Kamad property.

PRODUCERS

In the south-central interior, SIMILKAMEEN, HIGHMONT, LORNEX, and AFTON MINES are in full production. VALLEY COPPER are producing at a somewhat larger tonnage than the BETHLEHEM MILL capacity due to the relatively softer ore.

The GOLDSTREAM MINE north of REVELSTOKE is in full production and the BEAVERDELL MINE southeast of Kelowna produces at a limited capacity. DANKOE do custom milling and recently had five people working underground.

KAMAD SILVER in the Adams Lake area recently shipped 40 tonnes of ore to the Dankoe mill.

BANBURY MINES at Hedley closed at years' end with renewed underground exploration slated for the spring of 1984.

BRENDA MINE is on an extended shutdown until spring because of depressed metal prices.

SOUTHWEST DISTRICT - H. P. Wilton, Assistant Manager, Applied Programs and District Geologist, Victoria

INTRODUCTION

The Southwest District in 1983 saw an increase in the number of exploration projects, particularly around Harrison Lake and on Vancouver Island, but most were low budget, involving only surface exploration with little or no drilling. The emphasis continues to be on the search for precious metal deposits. Many prospectors and several companies have focused on the acquisition and re-examination of old mines or prospects with known precious metals values.

EXPLORATION

Minerals

At Harrison Lake RHYOLITE RESOURCES continued to explore their optioned gold-silver property near DOCTORS POINT (81) with a program of detailed drilling, mapping, and geochemistry. Late in the year they announced completion of an airborne geophysical survey of the property and plans to commence drill testing of several anomalies away from the main zone. At the former KN GOLD MINE (82), northeast of Harrison Hot Springs, ABO OIL CORPORATION completed 26 drill holes and an extensive soil geochemical survey. This is a gold prospect in which abundant gold-quartz veins are associated with quartz diorite stocks. The DOROTHY-IAM (SENECA) polymetallic volcanogenic massive sulphide deposit on the Chehalis River (83) was optioned by CURATOR RESOURCES from CHEVRON and a late-season drilling program has been announced. Minor surface examination of other massive sulphide prospects was carried out by LORNEX on the BIGFOOT property at Simms Creek and by FALCONBRIDGE COPPER on the newly optioned NORTH FORKS property at Cogburn Creek on the east side of Harrison Lake. Several claim groups around the north end of Harrison Lake, Fire Creek, and north along the Lillooet River were examined by various companies including KIDD CREEK, EQUUS PETROLEUM, LACANA, VALHALIA MINERALS, DIAMOND RESOURCES, and HILLSIDE ENERGY, in most cases looking for gold mineralization related to the Harrison Lake fracture system. Only TENQUILLE RESOURCES on Fire Creek indicated plans to drill in 1983. North of Pemberton, AMAZON PETROLEUM and TENQUILLE RESOURCES carried out a drilling program intended to expand the known reserves of high-grade silver-lead-zinc mineralization at the former LI-LI-KEL MINE (84).

The amount of exploration carried out in the COQUIHALLA GOLD BELT east of Hope was markedly reduced from that of previous years. CAROLIN MINES (85) focused their energies at trying to expand reserves at their producing mine while AQUARIUS RESOURCES, the only other major claim holder in the belt, limited their work to silt geochemistry on a few properties east of Spuzzum. COLT EXPLORATION and BEARCAT EXPLORATIONS announced a drilling program on Siwash Creek adjacent to the Carolin Mines property. ABERFORD RESOURCES and KIDD CREEK MINES conducted minor geochemical surveys on properties east of Hope. Several individuals and small companies examined areas of known gold and gold-silver-copper mineralization south of Hope and north of Stave Falls.

In the INDIAN RIVER AREA east of Britannia, MAGGIE MINES LTD. opened an underground exploration drive on the SLUMACH ZONE (86) and are reported to have intersected narrow mineralization about 47 metres below the high-grade surface showing on which they had earlier done extensive shallow drilling. This is a volcanogenic, base metal, massive sulphide prospect with high-grade but erratic gold and silver values. STACKPOOL RESOURCES, following up on their extensive 1982 airborne geophysical surveys, examined several anomalous zones in volcanic rocks north and southeast of Squamish. They have reported discovery of two new gold showings, 14.5 kilometres apart, in pyritic metavolcanic schists north of Whistler and are drilling a 1 000-metre test hole on their Britannia area claim block adjacent to Maggie Mines' Slumach property. KIDD CREEK MINES again conducted limited mapping and geochemical-geophysical surveys on their base metal properties near Squamish. ACACIA MINERAL DEVELOPMENT CORPORATION have reported further drilling on an old gold-silver vein prospect at Daisy Lake. The NORTHAIR MINE on Callaghan Creek remains closed pending improved metal prices but the company carried out some geophysical surveys on their claims surrounding the production lease. MAR-GOLD RESOURCES completed 15 shallow drill holes on their ICE AND YALAKUM gold-silver-copper prospect (87) on Ashlu Creek northwest of Squamish. Several major companies, including ANACONDA, NEWMONT, and DUPONT, continued property investigation and regional exploration for precious-base metal massive sulphides in the roof pendants of Cretaceous Gambier Group metavolcanic rocks between Squamish and Jervis Inlet.

AQUARIUS RESOURCES conducted only minor mapping, geophysics, and trenching at their OK PORPHYRY COPPER-MOLYBDENUM-SILVER (88) deposit 48 kilometres north of Powell River. Nevertheless, this remains a very significant base metal resource with published reserves of 402 000 000 tonnes at 0.33 per cent copper equivalent. CHALICE MINING continued systematic mapping and surveys on their extensive vein GOLD PROPERTY AT EGMONT and RENCON MINING reported some shallow drilling of a copper-silver prospect on Sechelt Inlet.

Considerable activity developed in 1983 at PHILLIPS ARM on the mainland north of Campbell River. CHARLEMAGNE RESOURCES reported some success with their rehabilitation and underground drill testing program at the former ALEXANDRIA GOLD-SILVER MINE (89) on Phillips Arm. Other companies active in the Phillips Arm and Thurlow Islands area, where there is potential for both gold/silver veins and precious metal skarns, included DUPONT, LAC MINERALS, and ARCHER, CATHRO, AND ASSOCIATES.

On Quadra Island, a few old workings and prospects, mainly gold-bearing copper skarns in Quatsino limestone, were investigated. BUTLER MOUNTAIN MINERALS CORP. worked on the LUCKY JIM GOLD-SILVER-COPPER MINE and GREENWICH RESOURCES INC. completed geophysical-geochemical surveys and overburden drilling and sampling on the GOLD-QUAD claims. Limited prospecting for gold veins occurred on Texada Island. RHYOLITE RESOURCES acquired several gold-silver properties on Texada Island and announced plans for limited drilling and trenching of known showings.

On northern Vancouver Island, UTAH MINES continued systematic exploration for new porphyry-type copper-gold deposits on their ISLAND COPPER mine property and throughout the Port Hardy to Kitsault area. On the CLIFF PROPERTY, which adjoins the north boundary of the Island Copper mine property (90), ENERGEX MINERALS completed eight drill holes totalling 732 metres and encountered economic grade polymetallic mineralization in several precious-base metal skarn zones. At MOUNT WASHINGTON west of Courtenay (91), BETTER RESOURCES LTD. is re-examining the old copper property as a potential precious metal prospect. Trenching of a large gold-arsenic soil anomaly has uncovered extensive new, gold-bearing, sulphide veins. Trenching and limited drilling of previously known base metal sulphides has confirmed their precious metal content. These mineralogically complex showings at MOUNT WASHINGTON are associated with a Tertiary volcanic centre.

Several of the old mine workings in the ZEBALLOS GOLD CAMP (92) were re-examined in 1983. ADMIRAL MINES and SIBOIA MINES completed a few shallow drill holes on surface veins on the GOLDEN PORTAL PROPERTY and reported impressive intersections (for example, 123.75 grams of gold per tonne and 40.3 grams of silver per tonne over 1.7 metres; 8.75 grams of gold per tonne over 10.7 metres). GLENCAIR RESOURCES undertook a bulk sampling program of the SPUD VALLEY MINE and ANGE GOLD bulk sampled a property on GOLDVALLEY CREEK. Small-scale drill programs were completed by GOLDFEVER RESOURCES at NOMASH GOLD and by BILLIKIN RESOURCES at the BEANO precious metal-rich pyrrhotite showings on Bingo Creek.

BP MINERALS continued detailed evaluation of the SIN PROPERTY (93) on Malksope River west of Fair Harbour where gold mineralization is thought

to be related to Tertiary epithermal activity. Nearby, on Easy Inlet, the KYU claims were drilled by FALCONBRIDGE and then optioned to SUNDANCE GOLD and CAL-DENVER. Precious metal anomalies in soil and alunite-pyrophyllite alteration of felsic volcanics suggest the possibility of epithermal mineralization.

Many prospectors and a small number of companies including NORANDA were active in the KENNEDY LAKE and KENNEDY RIVER areas re-examining showings and old mine workings containing both gold-silver-copper sulphide concentrations in quartz veins and precious metal skarns. MULTINATIONAL RESOURCES began drilling on the AU CLAIMS (94) late in the year. Significant gold values are reported from trenches in a silicified shear zone over a strike length of 735 metres.

One of the most active areas in the district is the part of Vancouver Island between ALBERNI INLET AND DUNCAN which is underlain predominantly by rocks of the Sicker Group. Some prospectors and companies were re-examining former mines and prospects known to contain precious metals in quartz veins and shear zones. However, the targets for most operators in the area are precious-base metal massive sulphide deposits associated with volcanic rocks of the Paleozoic Sicker Group. FALCONBRIDGE COPPER optioned a group of contiguous claim holdings on Mount Sicker north of Duncan which include the former LENORA AND TYEE (TWIN J) MINES (95). They have plans for some late-season drilling. Immediately to the west on Mount Brenton, ABERFORD RESOURCES completed extensive geophysical, geochemical, and trenching work on claims owned by LARAMIDE RESOURCES. A small company called TREK RESOURCES of Nanaimo have trenched and are now drilling a pyritic sericite schist horizon near RHEINHART LAKE. On HANLAM CREEK, IMPERIAL METALS carried out detailed surface surveys and mapping over a large airborne anomaly with coincident anomalous copper-gold-silver-zinc in soils. At MOUNT MCQUILLAN, southeast of Port Alberni, LODE RESOURCE CORPORATION have reported plans to carry out some diamond drilling late in the year on the BLACK PANTHER CROWN GRANT. Also on MOUNT MCQUILLAN, IMPERIAL METALS began an examination of ground optioned from Fording Coal. WESTMIN RESOURCES optioned the old THISTLE MINE (96) near Port Alberni from NEXUS RESOURCE CORPORATION. In the 1930's the Thistle produced about 6 160 tonnes of high-grade copper mineralization with very significant gold and silver. Other companies working in the Sicker belt in 1983 included COMINCO, AQUARIUS RESOURCES, ESSO RESOURCES, and CHEVRON. NORANDA investigated a large number of properties throughout the area with geophysical-geochemical surveys and minor trenching as part of a wide-ranging, systematic gold search on Vancouver Island.

At VALENTINE MOUNTAIN (97), 24 kilometres north of Sooke, BEAUPRE EXPLORATIONS carried out systematic geological studies and geochemical sampling on their extensive claim holdings. Detailed drilling of the main gold-rich quartz vein on the central Blaze claims early in the year gave some encouragement for continuation of economic gold values to depth and along strike from the main showing. Although most of the Leech River schist complex had been staked solidly by mid-year, mainly by one or two companies, no significant exploration has been reported aside from the work of a few individual prospectors on older properties. The bedrock gold discovery by Beaupre Explorations has again demonstrated the presence of gold in quartz veins in the Leech River complex as a source of the placer gold of southern Vancouver Island.

At least 19 small-scale PLACER OPERATIONS are known to have been active in 1983 on LOSS CREEK, SOMBRIO RIVER, SOOKE RIVER, LEECH RIVER, OLD WOLF CREEK, and elsewhere. At SOMBRIO POINT (98), 80 kilometres west of Victoria, MUSPAR RESOURCES have optioned the extensive placer holdings of Triangle Ventures on the Loss Creek delta. Significant quantities of gold, silver, and platinoid elements are reported. Test sampling and engineering studies are continuing.

Coal

In the coal basins of Vancouver Island, exploration in 1983 was limited to two small programs. WOLF MOUNTAIN MANAGEMENT LTD. carried out some test pitting and underground exploration prior to applying for the permits necessary to produce coal on a limited scale from the Wolf Mountain property 10 kilometres west of Nanaimo. WELDWOOD OF CANANDA performed some geological evaluations of their coal licences near Cumberland.

NOTICES OF WORK ON MINERAL CLAIMS

The numbers of notices of work on mineral claims, Form 9-10, filed to November 30, 1983 are:

Mineral	139
Placer	20
Quarry	4
Coal	1
Sand and Gravel	32
TOTAL	196

DEVELOPMENT

QUINSAM COAL (99) (WELDWOOD, BRINCO) RECEIVED STAGE II approval-in principle to develop an open-pit thermal coal operation at Middle Quinsam Lake near Campbell River. They anticipate producing 1 million tonnes of thermal coal per year by 1985.

OSPREY MINING AND EXPLORATION are applying for permits to reopen a small gold mine on Ashlu Creek 45 kilometres northwest of Squamish.

PRODUCERS

WESTMIN RESOURCES AT BUTTLE LAKE are continuing development of the large H-W OREBODY following completion of the shaft at 785 metres in April. The new mill presently under construction will result in a threefold increase in milling capacity on the property to 2 700 tonnes per day. Production from the H-W is expected by late 1984. Published geological reserves for the H-W orebody are 13 600 000 tonnes at 2.18 grams of gold per tonne, 34 grams of silver per tonne, 2.2 per cent copper, 0.3 per cent lead, and 5.3 per cent zinc. This orebody is reported to be still open in three directions and exploration is continuing. Meanwhile, underground exploration drilling in the existing LYNX MINE has significantly extended the known reserves of the LYNX WEST ZONE.

The ISLAND COPPER MINE of UTAH MINES, 16 kilometres south of Port Hardy, continued to mine approximately 40 000 tonnes per day of copper-gold-molybdenum ore, apparently without any serious cutbacks which have affected so many other porphyry operations in the Province.

The LADNER CREEK GOLD MINE OF CAROLIN MINES LTD. northeast of Hope has been operating at a loss in 1983 with brief shutdowns due to mining and milling problems. Management, however, remains optimistic that they will soon be operating profitably. There is a concerted exploration push at the mine to increase known reserves (presently stated to be 1 211 000 tonnes at 4.0 grams of gold per tonne) by drill testing the deep No. 3 zone and the northward plunge direction of all three major zones.

INDUSTRIAL MINERALS - Z. D. Hora, Industrial Minerals Specialist

INTRODUCTION

Most of British Columbia's industrial mineral operations continued at about the same level as 1982. A couple of new developments are: the PARSON barite mine is back in production following extended closure, and NICHOLSON SILICA reopened following receipt of a 30 000 tonne order. The following outline is by individual commodities.

ASBESTOS

CASSIAR (Fig. 5, No. 1) continued its operation in a similar fashion as last year as the markets for long fibre remained firm. The company drilled fibre anomalies in soils on its TANYA claims north of the mine.

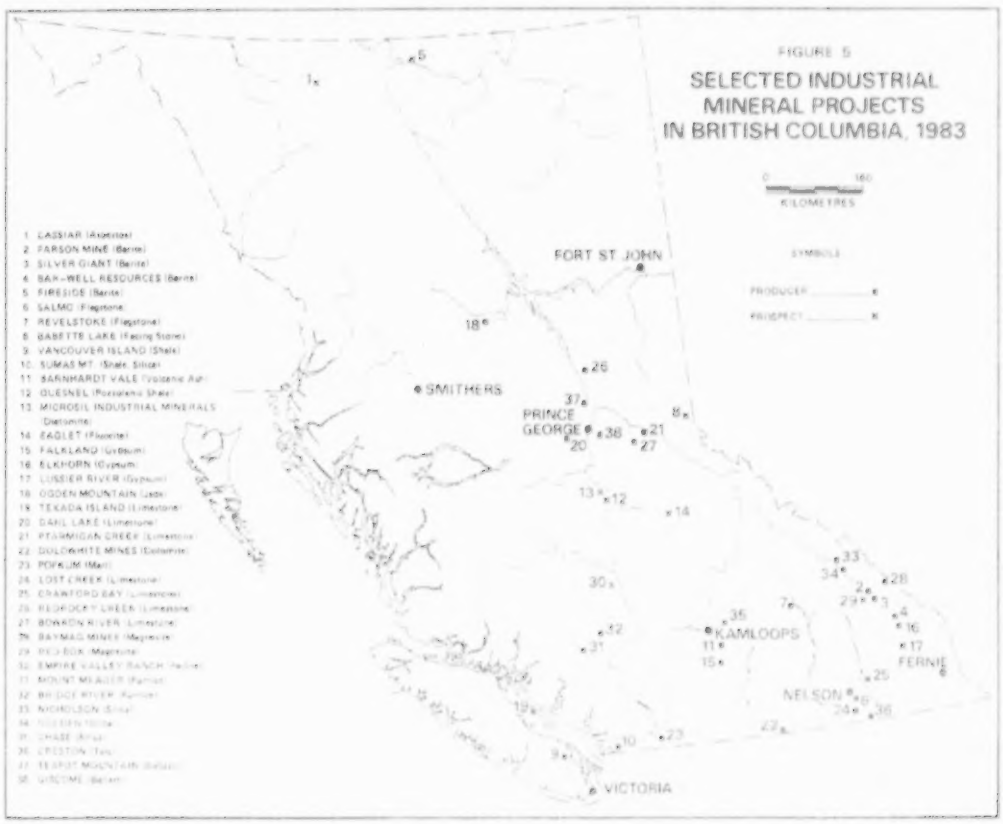
BARITE

The barite market as a result of a reduced oil and gas exploration in western Canada is still very soft. Present demand is only about 10 per cent of the 1979-80 level. MOUNTAIN MINERALS reactivated its PARSON MINE (2) which was extensively drilled and developed underground during 1980-81. Small-scale production was achieved in 1983. BRISCO and MINERAL KING mine tailings, both past producers with only limited reserves, are presently mothballed.

BAROID proceeded with small-scale processing of old tailings and of a stockpile at SILVER GIANT (3) near Spillimacheen. BAR-WELL RESOURCES (4) was inactive when visited in 1983, but equipment was at the plant and minesite. No ore is readily available at the old CAMERON SHOWING, nor at the MOUNT PEDLEY site (4).

New developments

DRESSER has reported bulk sampling from its FIRESIDE (5) deposit on the Alaska Highway.



BUILDING STONE

The market for Salmo quartzite (6) and Revelstoke (7) micaschist for use a flagstone is at an all-time low, probably only 10 per cent of 1979-80 sales which were estimated at more than 10 000 tonnes.

New developments

CANROCK is continuing with development of its BABETTE LAKE quartzite deposit. Presently the company is opening a test quarry on the McGREGOR PASS SITE (8) and a finishing plant in Delta is under construction. CANROCK proposed to produce 25 000 tonnes of large blocks (approximately 20 tonnes each) in 1984 and double this number in the following years.

The quarried blocks will be processed by the Delta facility into cut and polished slabs for facing and other dimension stone applications, some will be exported as raw blocks. Smaller blocks will be made into floor tile and similar small-size products.

CLAY AND SHALE

Clayey mudstone ("shale") production from VANCOUVER ISLAND (9) and SUMAS MOUNTAIN (10), and production of altered volcanic ash at BARNHARDT VALE (11) for the manufacturing of cement, proceeded at a reduced scale as the cement market is still weak.

CLAYBURN INDUSTRIES (10) produced very few refractory bricks in 1983 because of market conditions. The company concentrated mainly on the manufacturing of castable refractories and the small-scale production of facing brick.

New developments

The burnt shale ("red shale") south of QUESNEL (12), derived from an underground burnt coal seam, is quarried at a rate of 300 tonnes per day by CANARCTIC VENTURES LTD. It is used as a natural pozzolan.

DIATOMITE

New developments

MICROSIL rebuilt the CROWNITE diatomite facility at Quesnel (13) after several years of shutdown and moved it to the minesite. The 100-tonne per day capacity is at present about 50 per cent utilized. Calcined diatomaceous earth is used in absorbents, for hydroponic gardening, pozzolan, and lightweight aggregate. CLAYBURN INDUSTIRES are developing a special lightweight refractory/insulation and brick for aluminum smelters based on Quesnel diatomite. The bricks presently used are imported from Europe.

FLUORITE

EAGLET MINES LTD. (14) continued underground exploration of its large, but low-grade fluorspar deposit on the northern shore of Quesnel Lake.

In 1983, 409 metres of drift and crosscut and 43.6 metres of raising were completed. The drift in the mineralized zone averages 12.6 per cent fluorspar over 3.3 metres. The best silver assays reported to date from the drift is 78.4 grams silver per tonne. 35.7 tonnes of mill feed were taken for a pilot plant metallurgy test.

GYPSUM AND ANHYDRITE

LAFARGE CANADA is now supplying both of its cement plants in British Columbia (Kamloops and Richmond) from the FALKLAND DEPOSIT (15) and reports increased production from this site. WESTROCK INDUSTRIES in Invermere operated at about 50 per cent capacity (400 000 tonnes per year). This is the first year of production from the new ELKHORN QUARRY (16) following its development in 1982. The original main quarry, 3.5 kilometres to the north, was mined out after several decades of continuous production.

New developments

DOMTAR carried out bulk sampling from test pits on their properties in LUSSIER RIVER drainage (17).

JADE

In 1983, CONTINENTAL JADE had a working crew on its OGDEN MOUNTAIN (18) property. The other jade areas in the Province were inactive in 1983. The jade market appears to be saturated for the time being and production from CASSIAR ASBESTOS (1) and CONTINENTAL JADE is enough to cover the present demand.

LIMESTONE

The production of "cement rock" followed the traditional pattern of adapting to the lower production levels of all three British Columbia cement producers.

On TEXADA ISLAND the DOMTAR (19) property was taken over by the OREGON PORTLAND CEMENT COMPANY. The new operator was given a contract to supply the Genstar plant in Delta (rock was originally provided by Ideal Rock Products). There are no changes in LAFARGE (19) and IMPERIAL LIMESTONE (19) operations.

Lime

Both major lime producers in British Columbia reconstructed their processing plants (TEXADA LIME of SELCO) or installed additional units (PAVILION LAKE of STEEL BROTHERS) in 1980-81 at a most inappropriate time. As a result they operated in 1983 at only 25 per cent of production capacity.

Most of the pulp and paper mills operate small lime kilns buying limestone from nearby quarries. The main purpose and convenience of making their own lime is that they can recycle a major part of used lime instead of disposing of it. Limestone for pulp and paper mills is supplied from three production centres: quarries on TEXADA ISLAND, the DAHL LAKE quarry (23) of KOKANEE CONTRACTING west of Prince George, and the PTARMIGAN CREEK quarry (21) of QUESNEL READY MIX.

Crushed and ground limestone and dolomite

KOKANEE CONTRACTING of Prince George is supplying several local pulp and paper mills with a chemical grade limestone from its quarry at DAHL LAKE (23) west of the city. The company is selectively mining high-grade pockets from a large limestone body that is locally contaminated by intrusive dykes and siliceous zones. The 1982 and 1983 output was significantly reduced from previous years.

QUESNEL READY MIX quarry at PTARMIGAN CREEK (21), 20 kilometres west of Prince George is another supplier of chemical grade limestone for the pulp and paper industry in the area and also a major source of rip-rap and ballast for CNR. The present depressed economic situation did not have a significant impact on production from this quarry because of firm orders from CNR. The site has expansion problems, however, because it is adjacent to a small provincial park.

DOLOWHITE MINES (23) of Rock Creek are producing ground dolomite as a soil conditioner and a variety of sized white rock chips for landscaping and decorative purposes. The operation changed ownership in 1982 and does not seem to be severely affected by the present economic situation.

INTERNATIONAL MARBLE AND STONE CO. (IMASCO) is processing white limestone and dolomitic limestone into a variety of fillers, extenders and coating agents, from several underground mines in the Kootenay Lake area and south of Salmo. The processing is done in Kirdar. Production of marl as agricultural limestone in POPKUM (23) near Chilliwack continued at previous years' levels.

New developments

Because of access difficulties to its limestone mine at SWIFT CREEK south of Salmo, IMASCO developed and put into production in 1983 a new site in the nearby LOST CREEK (24) area. As well, the new mine in the CRAWFORD BAY (25) area is now fully operational. On the coast, the company outlined reserves of white limestone in the Port McNeill area on Vancouver Island and is building a milling facility in Delta to produce micronized limestone. IMPERIAL LIMESTONE built and put in production in 1982 a similar facility in Washington State to process its white limestone quarried on Texada Island.

TRI-LIME RESOURCES developed and put into production this year the REDROCKY CREEK (26) limestone deposit, situated 100 kilometes north of Prince George, with the aim of providing agriculture limestone for the Peace River area. The processing capacity of the unit is approximately 80 tonnes per hour. In the BOWRON RIVER area east of Prince George, WESTERN LIME (27) have started a smaller scale operation of a similar kind for Alberta markets. In both cases, the transportation costs must be a heavy burden.

MAGNESITE

During 1983, MAGNO MINES (28) processed the stockpile mined in 1982 and continued on a small scale to develop the quarry and strip the overburden. Mining was to begin early in the fall. Magnesite is hauled to Exshaw, Alberta where it is processed at a rate of 15 to 20 tonnes per day into caustic magnesia in the lime kiln leased from Lafarge Canada. In Exshaw, the company is also building a sintering unit to produce high density refractory magnesia.

New developments

Bulk sampling was carried out by MCLP on the RED BOX (29) group of claims on Driftwood Creek, west of Spillimacheen for trial processing of magnesite from this location. A reconnaissance of the area indicates a substantial tonnage of material of lower grade than that from the Box Mountain site.

PERLITE

New developments

AURUM MINES completed drilling and bulk sampling of their deposit in the EMPIRE VALLEY RANCH (30) area.

PUMICE

New developments

Two small-scale operations started pumice shipments from the Pemberton area for use as lightweight aggregate in concrete products. WESTERN PUMICE PRODUCTS were processing their 1982 stockpile from the MOUNT MEAGER (31) deposit. The new mining proposed for the latter part of this summer has not yet started. In the BRIDGE RIVER VALLEY (32) near Bralorne, another small operation is processing a layer of volcanic ash to obtain a similar product. The two operations, it not seem to be in conflict, since Western Pumice is concentrating on the Vancouver-Lower Mainland market, while the other operation is shipping through Lillooet to the British Columbia interior.

SILICA

Shipping of the quartz conglomerate from SUMAS MOUNTAIN (10) to the Richmond cement plant, as well as silica imports for the plant in Delta, proceeded in 1983 with no significant changes. Also the processing of the old mine waste in Oliver to produce, on a small scale, a variety of sized white chips, followed the pattern of previous years.

The BERT MILLER TRUCKING AND CONTRACTING operation near NICHOLSON (33) was inactive for a year. When visited in August the site was being prepared for reopening to fill a 30 000 tonne contract to the Wenatchee ferrosilicon plant.

MOUNTAIN MINERALS (34) in Golden is continuing to market most of its production. The processing plant for the glass grade sand is being systematically improved. The coarse fraction is shipped for silicon carbide manufacturing. CONTECH ENTERPRISES (35) operation , which mined a quartz vein near CHASE, east of Kamloops during 1981-82, went into receivership and has been inactive.

TALC

New developments

IMASCO is initiating trial shipments from its property west of CRESTON (36). The product is a relatively low quality ground talc (talc schist) for applications such as dusting components in asphalt trades.

AGGREGATE AND BALLAST

CPR, CNR, and BCR reactivated some of their railroad ballast quarries this year. Consequently, the TEAPOT MOUNTAIN (37) deposit of BCR north of Prince George will be almost depleted at the end of this season. The CNR quarry near Giscome, east of Prince George has been depleted.

New developments

CNR developed and started production of railroad ballast from a NEW QUARRY NEAR GISCOME (38) about 2 kilometres west of the old one. In 1983, the Ministry of Lands, Parks and Housing gave a contract for the second stage of the Westwood Plateau study, to evaluate the Coquitlan Valley aggregate deposits as part of an overall development plan for the area.

GOVERNMENT FIELD ACTIVITIES - W. J. McMillan

Fieldwork undertaken by geologists of the Geological Branch during 1983 was cut back in response to hiring restraints and lowered operating funds. Three of the seven Project Geologists had shortened seasons. In response to exploration activity and commodity projections, most mineral deposit projects are now focused on areas with massive sulphide or precious metal potential. Activities in coal continued at 1981 levels - thanks to filling three staff vacancies during 1982. Results of projects conducted by the Geological Branch are presented in the publication Geological Fieldwork, 1983. Release of the publication is scheduled to coincide with the joint Chamber of Mines-government review of activities in Vancouver January 26, 1984.

In the Southeast Coalfield, DAVID GRIEVE (Fig. 6, No. 1) extended field mapping to include an assessment of the potential of tonsteins as regional marker horizons, and completed a joint study of the Elk Formation with Neil Ollerenshaw of the Geological Survey of Canada.

In northeast British Columbia, District Geologist ANDREW LEGUN and Project Geologist WARD KILBY (2) were active. Legun continued studies of stratigraphy in the Carbon Creek area that he initiated last year. He also conducted land use oriented studies in Wokkpash Lake area (3). Kilby followed up problems discovered during compilation of 1:50 000 geological base maps of the coalfield and worked in liaison with Legun. Kilby stressed microcomputer utilization in the field as it relates to structural interpretation and computer modelling of coal measures. Widespread sampling of coal has begun; it will enable regional rank and

quality studies to be made. Continued assessment of tonsteins as a tool in regional correlations, as described by Duff and Gilchrist (Paper 1981-3), is underway; results so far are encouraging. Most tonsteins found have been in the upper Gething Formation but others occur elsewhere in the Gething and in the Moosebar Formation. These 'time lines' should improve correlation throughout the Northeast Coalfield.

Coal Project Geologist JAHAK KOO (4) expanded his study of coal measures in the Telkwa area of north-central British Columbia to include the coal potential of other Lower Cretaceous rocks in southern Bowser Basin. He also made a brief reconnaissance of the Mt. Klappan area, an anthracite prospect in northern Bowser Basin. An attempt is being made to correlate units between various isolated basins to better understand their development and assess their coal potential.

Project Geologists Trygve Høy, Neil Church, Gerry Ray, and Peter Eastwood complemented work of District Geologists Dave Grieve, George Addie, Gordon White, and Paul Wilton in the southern part of the Province.

TRYGVE HØY (5) spent several weeks in the Cranbrook area and completed the field component of his study of the Purcell Supergroup in southeastern British Columbia. Høy will work from this background knowledge into a new project - the regional metallogeny of southeastern British Columbia. The new project involves both field studies and a literature survey; it will result in production of mineral deposit potential and associated maps and reports.

GEORGE ADDIE (6) continued a study of Tillicum Mountain gold deposits, conducted property examinations, and assisted prospectors in West Kootenay District. NEIL CHURCH (7) mapped an area of 200 square kilometres and studied the Sylvester K and other active mineral prospects in Greenwood area. The project is designed to produce an up-to-date map and report on this historic but active mining camp.

GERRY RAY (8) completed fieldwork on the Coquihalla gold belt project extending mapping for 50 kilometres along the belt; in total, 340 square kilometres of the belt have now been mapped. Properties examined included the Ward, Monument, and Spuz showings. He also examined the geological setting of Rhyolite Resources' Nagy gold-silver-bismuth occurrence, the old Providence mine, and the RN (Geo) mine in an attempt to assess the regional exploration potential of the Harrison Lake area.

District Geologist PAUL WILTON carried out property examinations on Vancouver Island and the southwest mainland and assisted prospectors in

the Southwest District. PETER EASTWOOD, who retires in January 1984, remained in Victoria this season to complete reports for his projects. These include a study of the geology of the Quinsam Coalfield, determination of the stratigraphy of Bonanza Group rocks at Island Copper, and an assessment of the nature and potential of polymetallic massive sulphide deposits in the Mount Sicker area of Vancouver Island.

GORDON WHITE, in the South-Central District, made property examinations, assisted prospectors, and continued a study of the mineral potential of carbonatites in Blue River area. He also completed a field survey of the proposed Brent Mountain Recreation Area (14).

In the Central District, aside from a few days by Project Geologist DANI ALLDRICK at Wells (9), Prince George District Geologist TED FAULKNER was the only active Ministry geologist. Faulkner is heavily involved in land use issues, some of which required site specific property examinations. He also conducted property examinations and provided assistance to prospectors. At Mosquito Creek (9) work by Alldrick concentrated on understanding mine stratigraphy and identification of marker horizons and ore controls.

Again this season precious metal potential was emphasized in work by District and Project Geologists in the Northwest District. District Geologist TOM SCHROETER continued a joint project with ANDRE PANTELEYEV and student LARRY DIAKOW in the Toodoggone area (10); a preliminary map is in preparation and scheduled for release in January 1984. Schroeter also worked on the Sulphurets, Mt. Johnny, and Windy-Craggy deposits (11). Geologist GARY WHITE moved from Charlie Lake to the Smithers office on February 1st. White continued his studies of coal rank distribution in the Northeast Coalfields but concentrated on field supervision of grantees on the Prospectors' Assistance Program. He also helped Tom Schroeter cover the huge Northwest District.

DON MacINTYRE was in Victoria until mid-July writing reports. Subsequently he continued work on the Windy-Craggy copper-cobalt deposit (11), briefly visited the Midway silver-lead-zinc deposit, and began a reconnaissance of porphyry and volcanogenic massive sulphide prospects in the Babine Range near Smithers. Approximately 300 square kilometres were mapped at scale 1:20 000 in the Windy-Craggy area; during the work he examined the Tats and Mus showings. High gold values found in Windy-Craggy deposit and the Rime showing should add impetus to work in this area in 1984.

ANDRE PANTELEYEV also had a curtailed field season to complete research and begin writing reports on several projects. He spent two weeks

completing the field component of his project on epithermal veins in the Toodoggone area (10). The project is concentrating on volcanic stratigraphy and regional correlation of rock units in the 'Toodoggone volcanics.' Detailed field studies in Toodoggone area were continued in July and August by LARRY DIAKOW. This study will contribute to the preliminary map and form the basis of a Ph.D. thesis at University of Western Ontario.

DANI ALLDRICK spent his second field season expanding work begun last year in Salmon River area (12) north of Stewart. He mapped 105 square kilometres and examined active properties including Scottie Gold mine, the Consolidated Silver Butte prospect, Big Missouri mine, and Porter-Idaho mine. This project will attempt to determine the age and stratigraphy of the volcanic rocks that are host to the Big Missouri, Silbak Premier, and other precious metal deposits in the area.

Budget problems prevented initiation of any major field programs by the Resource Data and Analysis section. RON SMYTH travelled to various areas in the Province on familiarization tours and carried out a brief field assessment of a proposed ecological reserve in the Cluckata Ridge area (13) near Taseko Lake. DANNY HORA conducted property examinations of several barite, magnesite, and building stone occurrences. He also visited active industrial mineral operations in the Province.

The cooperation extended by mining and exploration companies throughout the Province is acknowledged. Geological discussions and exchanges of ideas with company geologists are vital to our effectiveness; we gratefully acknowledge the spirit of cooperation that makes such exchanges possible. Furthermore as the Ministry field budget is small, we could not operate in more remote areas like Toodoggone, Gataga, and Windy-Craggy without such cooperation.

Queen's Printer for British Columbia ©
Victoria, 1984